

Overwork can kill

Especially if combined with high demand, low control, and poor social support

The death of a junior doctor in Britain last year, after working excessive hours and sleeping little, brought new relevance to the question, can overwork kill? It seems reasonable to suggest that excessive workload could be harmful. In Japan, there is even a recognised syndrome of "death from overwork"; the family of a Japanese man who killed himself after working for 17 months without a day off has recently won compensation from his employer.¹ But the British government disagrees with the European Union that a proposal to limit the working week to 48 hours should be regarded as a health and safety issue. Indeed, there is surprisingly little hard evidence about whether mortality can be increased by physical or psychological overwork. A recent review noted a lack of research on the health effects of the interaction of physical and psychosocial factors at work.²

The empirical research that exists suggests that higher workloads do increase disease and death rates. A Danish study, which followed up 2465 bus drivers over seven years, found that objective workload, as measured by the intensity of traffic on the drivers' routes, was the factor most strongly associated with death or admission to hospital with acute myocardial infarction.³ The incidence of both death and hospitalisation in those with higher workloads was more than twice that in the group with low workloads. Increased pace of work over the preceding five years and a lack of social contact with colleagues during spare time were also associated with an increased risk of myocardial infarction. A seven year follow up of 500 retired Swedish men found that, after adjustment for social class and recognised cardiovascular risk factors, job strain predicted mortality.⁴ Job strain was defined as the combination of high demand and low control. Mortality was significantly reduced in those who had good social networks and support, suggesting a buffering effect. A study of 99 029 Italian railway men aged 40-59 years also found interactions between different aspects of workload and mortality.⁵ The men were classified into three levels of physical activity and job responsibility and followed up for five years. Low physical activity at work and high job responsibility were associated with increased risk of myocardial infarction, while high physical activity and low or medium job responsibility were associated with greater risk of death from chronic bronchitis or violence.

These results are consistent with Karasek's job strain model,⁶ as well as studies showing that the combination of high job demands (workload and pace) and low decision latitude (individual control at work, influence on decisions, and opportunities for skill development) contributes to an increased risk of ischaemic heart disease and increased mortality.^{7 8} In combination with other factors, high workload has also been associated with other forms of ill health. Musculoskeletal

disease, for example, has been found to be associated with high perceived workload, time pressure, low control on the job, monotonous work, and lack of social support by colleagues.⁹

By what mechanisms might work overload influence health? Some researchers have suggested that, for heart disease, neurogenic and hormonal factors could operate, with cardiac electrical changes and increased secretion of catecholamines and cortisol.¹⁰ A longitudinal study of Swedish nurses found that those with the highest workload, defined by objective criteria, had the highest levels of plasma cortisol, the highest systolic blood pressure during working hours, and the most sleep disturbance.¹¹ A British study found that bus drivers facing changes in traffic congestion experienced changes in job strain, which, in turn, could account for fluctuations in neuroendocrine activity.¹²

Cognitive mediators may also play a part. For example, one could postulate that high perceived job demand may impair performance due to poorer memory and concentration and increased clumsiness and disorganisation, leading to increased errors, accidents, and safety hazards. Because of the time and energy commitment, high job demand may also interfere with access to the buffering effects of social support and to information and instruction on avoiding accidents. High workloads may also be associated with environments that are not conducive to learning how to perform tasks safely, nor to receiving help if there is an accident.¹

The actual physical strain of work may also pose a risk to life. This still occurs in many countries where there are extremes of climate and a poorly nourished, poorly organised labour force (sometimes including children) weakened by disease, and working long hours in physically demanding jobs. Such conditions lead to a high mortality from accidents and disease.¹³ The detailed circumstances and the contribution of high physical workload and other factors are rarely documented.

It seems that overwork can kill, but that we know precious little about when, who, and how. Of course there have been big improvements in developed countries since the Industrial Revolution, but sometimes physical overwork has been replaced by psychological overload. And as unemployment has increased over the past decade, those in work have experienced increased workload, work pressure, and hours of work. If this is not to reap its predicted toll, we need much greater understanding about effects, mechanisms, and, most importantly, preventive strategies. We also need government strategies and legislation to increase employment, reduce the working week, and monitor and intervene to prevent health and safety hazards at work, which include overwork. This should involve making employers responsible for preventing

work overload and stress, as well as providing help for individuals with work stress related illness.

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Privatising the NHS: dentistry paves the way

Mixed purchasing must be managed

The suggestion last year that mixed public and private finance might be introduced to health care in Britain¹ provoked an outcry among supporters of the NHS.² Many feared that the government would extend free market principles and accelerate privatisation because of worries about NHS funding. However, the mixed purchasing proposals had a historical ring to most dentists. NHS dentistry has already forged close links with the private sector. Strict curbs on NHS spending on dentistry have led to patients' co-payments increasing steadily and to a rapid expansion of the private market. Although the number of dentists in the general dental service of the NHS rose from under 15 000 in 1979 to 19 400 in March 1994,³ the number who are also registered with the three largest private dental insurance schemes has risen from none to about 7500 in the past 10 years. These changes provide salutary lessons for other areas of health care.

Despite the growing contribution of the private sector, the demands on public funds continue to increase. Between 1978-9 and 1993-4, gross expenditure on general dental services in Britain increased by 57% in real terms to £1475m. Net expenditure (excluding patients' contributions) increased by 37% over the same period.³ Costs to the Treasury of emergency dental care have risen particularly quickly, from £2.7m in 1989 to £10.7m in 1993.⁴ At 31 March 1994, 25.4 million people were registered under NHS capitation and about 800 000 subscribed to private dental care schemes.

Patients' contribution to NHS dental treatment has risen substantially, such that patients other than those who are exempt now contribute 80% of the cost up to a maximum of £300 for each course of treatment. The abolition of the free dental check in 1989 may deter patients and dentists from continuous dental care as well as surveillance, which is much needed in view of increasing rates of oral cancer and precancer⁵; but no research has been done to investigate this. The cut in fees in 1992, higher costs due to higher standards of anaesthesia and cross infection control, and uncertainty about future funding arrangements for general dental services have encouraged dentists to develop their private practice and to reduce the size of their NHS lists. Poorer urban and rural areas, where dental health is poorer and private dental practice harder to sustain, depend increasingly on more costly, safety net, community or hospital services.

And then there are the emergency dental services. Private funding and withdrawal of dentists from the NHS is leading to a substantial shift of people with toothache to district general

hospitals, family practices, and dental hospitals. Studies in dental hospitals show that patients increasingly opt for extractions when teeth would previously have been restored, albeit with more expensive restorative procedures.⁶ In many areas it is now possible to obtain private or NHS treatment for toothache at high street dental practices (which for people not exempt from payment are not free at the point of delivery), community dental clinics, accident and emergency departments, or dental hospitals (where no charges are made). The government has identified the community dental service as most appropriate to provide this safety net.³ But it has also stated its intention to introduce copayments in the community service so that patient charges are similar to those levied in the general dental service.³

There are signs that the steady trickle of people with toothache presenting at family practices is becoming a flood, and the BMA's general medical services committee has issued guidance on the responsibilities of general practitioners.⁷ The committee recommends that general practitioners should ask patients about their dental registration status, though most patients do not know if they are registered. For those not registered, family health services authorities and health boards are required to provide emergency out of hours dental treatment. The committee warns that "general practitioners should be cautious about accepting a patient's understanding of advice from a dentist about the nature of their dental condition."⁷

The rate of registration of children with dentists has been encouraging, but in Scotland only half of five year olds were in NHS capitation schemes in 1993-4, and non-registration was associated with substantially poorer dental health and greater social deprivation.⁸ Many dentists will countenance treating children under the NHS only if their parents are prepared to join a private insurance scheme.

The effect of these changes on dental health is hard to assess, and causal links are difficult to establish, particularly as the adult dental health survey takes place only every 10 years and the last one was in 1988. At the same time, successive surveys of children's dental health suggest that it is steadily improving, particularly in children aged 15 years.⁹ The obvious danger is that large numbers of adults on low incomes who used to be able to afford NHS dentistry cannot now afford care and may be falling through the net completely. This possibility makes the 1998 adult dental survey particularly important.

Mixed financing has been good news for many dentists; they have always valued their independent contractual relationship